

**REMARKS**

Reconsideration and allowance of the present application are respectfully requested in light of the amendments above and the remarks that follow. Applicant proposes changes to claims 27 and 37 that were implicitly suggested in the final Office Action of October 5, 2007, and therefore should not raise new issues or require a new search, but will place the application in form for allowance or better form for appeal. Accordingly, entry is deemed proper.

Applicant gratefully acknowledges the Examiner's continued indication that claims 9, 18, 28 and 38 would be allowable if rewritten in independent form, including all of the limitations of the base claim and any intervening claims.

**Finality of Office Action**

It is respectfully submitted that the Office Action of October 5, 2007, was prematurely made final. Specifically, the Office Action includes a new grounds of rejection of claims 27 and 37 (discussed below) that were not necessitated by the Amendment of September 11, 2007.

**Rejection under 35 U.S.C. ¶ 112, Second Paragraph**

In the Office Action, claims 27 and 37 were rejected under 35 U.S.C. § 112, second paragraph for allegedly being indefinite due to a perceived lack of antecedent basis for "the first similar face images" and "the second similar face images". While Applicants do not believe the claims were deficient under this section of the statute, the implicitly requested change does not affect the scope of protection being sought, and therefore the articles "the" are proposed to be deleted to obviate the rejection. Since this change will remove the stated

grounds of rejection without requiring a new search, Applicants respectfully request entry of this change.

Rejections under 35 U.S.C. ¶ 103

The Office Action includes a rejection of claims 10-12, 14, 17, 29, 30, 33, 36 and 37 under 35 U.S.C. § 103(a) as allegedly not being patentable over “Mosaic Image Method: A Local And Global Method” by Li Zhao and Yee-Hong Yang ("*Zhao*") in view of “Eigenfaces vs. Fisherfaces: Recognition Using Class Specific Linear Projection” by Peter N. Belhumeur, João P. Hespanha, and David J. Kriegman ("*Belhumeur*"); a rejection of claims 1-3, 5, 8, 19, 20, 23, 26 and 27 under 35 U.S.C. § 103(a) as allegedly being unpatentable over the purported combination of *Zhao* and *Belhumeur* in view of “Generalized Discriminant Analysis Using a Kernel Approach” by G. Baudat and F. Anouar ("*Baudat*"); a rejection of claims 15, 16, 34 and 35 under 35 U.S.C. § 103(a) as allegedly not being patentable over the purported combination of *Zhao* and *Belhumeur* in view of “Multiresolution Eigenface-Components” by A.Z. Kouzani, F. He, and K. Sammut ("*Kouzani*"); a rejection of claims 6, 7, 24 and 25 under 35 U.S.C. § 103(a) as allegedly not being patentable over the purported combination of *Zhao*, *Belhumeur*, *Baudat* in view of *Kouzani*; a rejection of claims 13 and 31 under 35 U.S.C. § 103(a) as allegedly not being patentable over the purported combination of *Zhao* and *Belhumeur* in view of U.S. Patent No. 6,567,771 to *Erdogan et al.* ("*Erdogan*"); a rejection of claims 4 and 21 under 35 U.S.C. § 103(a) as allegedly not being patentable over the purported combination of *Zhao*, *Belhumeur*, and *Baudat* in view of *Erdogan*; a rejection of claim 32 under 35 U.S.C. § 103(a) as allegedly not being patentable over the purported combination of *Zhao* and *Belhumeur* in view of U.S. Patent Application Publication No. 2004/0066953 to *Bock*; and a rejection of claim 22 under 35 U.S.C. § 103(a) as allegedly not

being patentable over the purported combination of *Zhao*, *Belhumeur*, and *Baudat* in view of *Bock*. These rejections are respectfully traversed.

As stated in the last Amendment of September 11, 2007, to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a), the applied references, taken alone or in combination, must teach or suggest each and every element recited in the claims. (*See*, M.P.E.P § 2143, (8th ed., rev. Aug. 2006.)) Applicant respectfully traverses the rejections under 35 U.S.C. § 103(a) because *Zhao* and *Belhumeur* when taken alone or in combination does not meet each and every element recited in the claims. As more fully explained below, the hypothetical combination does not teach or suggest both a "first LDA transformation unit" and a "second LDA transformation unit" even if one were to assume *arguendo* that the combination proposed in the Office Action was proper.

*Zhao*

*Zhao* discloses a method for performing image recognition system using principal component analysis ("PCA"). The method includes slicing images into a mosaic of equal-sized images; generating local eigenvectors using "PCA", and forming global eigenvectors are formed from the local eigenvectors. (*Zhao*, p. 1423, ¶ 3.) Image recognition is performed based on global eigenvectors by comparing training images with a test image. (*Zhao*, p. 1427, § 5.)

More specifically, in *Zhao*, a vector  $v_{i,j}$  is generated by raster scanning the mosaic images. (*Zhao*, p. 1424, ¶ 1.) By concatenating these vectors, a vector  $V$  for the whole image is produced. (*Id.*) Then, applying PCA to each mosaic  $v_{i,j}$ , local eigenvectors  $\Phi_t^{i,j}$  are computed. (*Zhao*, p. 1424, ¶ 2.) By concatenating eigenvectors  $\Phi_t^{i,j}$  according to the relative

positions of the corresponding mosaic images, global eigenvectors  $\Phi_t$  are generated. (*Id.*) Thus, the method disclosed by *Zhao* includes PCA to generate local eigenvectors  $\Phi_t^{i,j}$  from mosaic images. However, the global eigenvector  $\Phi_t$  is generated by concatenation and not by PCA or other such algorithm.

Applicant's claim 10 recites "a first LDA transformation unit for LDA transforming the divided facial components into component descriptors of the facial components; a vector synthesis unit for synthesizing the transformed component descriptors into a single vector; a second LDA transformation unit for LDA transforming the single vector into a single face descriptor (emphasis added)." The Office apparently asserts that *Zhao* steps of computing local eigenvectors  $\Phi_t^{i,j}$  by PCA and combining local eigenvectors  $\Phi_t^{i,j}$  into a global eigenvector corresponds the claimed "LDA transforming the divided facial components into component descriptors" and "synthesizing the transformed component descriptors into a single vector," respectively. It is difficult to determine whether this assertion is accurate, but a point that is clear is that even assuming *arguendo* the Office is make a fair analogy, there are nevertheless elements of the claims missing from the applied art, whether taken alone or in combination.

Specifically, nowhere does *Zhao* disclose or suggest the claimed "second LDA transforming unit for LDA transforming the single vector into a single face descriptor" (emphasis added), as recited in Applicant's claim 10. It is noted that the final Office Action did not address this point as made in the Amendment of September 11, 2007.

*Bellhumer and the Hypothetical Combination*

*Belhumeur* does not overcome this deficiency of *Zhao*. *Belhumeur* provides a comparison of various algorithms for performing facial recognition. The Office apparently relies on *Belhumeur* for its alleged teaching that LDA may be substituted PCA for facial recognition. (Office Action, p. 5:5-11.) However, *Belhumeur* does not disclose or suggest the above-noted feature missing from *Zhao* (i.e., "a second LDA transformation unit for LDA transforming the single vector into a single face descriptor" in the context of claim 10). Accordingly, *Zhao* and *Belhumeur*, taken alone or in combination, fail to disclose or suggest each and every feature recited in claim 1 and, therefore, cannot support a rejection of claim 1 under 35 U.S.C. § 103(a).

The Office Action includes the suggestion that the "individual units are not expressly disclosed in the reference; however, it was explained it is obvious to have an apparatus in order to carry out the method and that units that carry out functions described are units in each of the steps." Applicants apologize if the earlier arguments were not sufficiently clear, but the basis argument is that the whether one views the recitation "a second LDA transformation unit for LDA transforming the single vector into a single face descriptor" as an apparatus or by its underlying function of method step, it is not meant. Applicants were not suggesting that the applied art did not disclose an apparatus, but rather that it did not teach an apparatus or unit that performed as recited in claim 10 (or for that matter the underlying method utilizing two transformations as described in claim 10).

Claims 11, 12, 14 and 17 depend from claim 10. Accordingly, these claims are patentable over the *Zhao* and *Belhumeur* at least due to their dependence from claim 10.

Claim 29, although of different scope than claim 10, recites features similar to those recited in claim 10. Accordingly, claim 29 is patentable over the purported combination of

*Zhao* and *Belhumeur* for the same reasons as set forth above with regard to claim 10; and claims 30, 33, 36 and 37, which depend from claim 29, are also patentable.

Rejection of Claims 1-3, 5, 8, 19, 20, 23, 26 and 27

Claim 1 recites, *inter alia*, "a Linear Discriminant Analysis (LDA) transformation unit for LDA transforming the divided facial components into component descriptors of the facial components; a vector synthesis unit for synthesizing the transformed component descriptors into a single vector; [and] a Generalized Discriminant Analysis (GDA) transformation unit for GDA transforming the single vector into a single face descriptor" (emphasis added).

Thus, similar to Applicant's claim 10, claim 1 recites two transformations - a LDA transformation and a GDA transformation. However, as argued above with regard to claim 10, *Zhao* only discloses one transformation and *Belhumeur* does not cure this deficiency. Thus, for the same reasons provided above with regard to claim 10, *Zhao* and *Belhumeur* fail to teach or suggest the above-noted features of claim 1.

The addition of *Baudat* does not cure the deficiencies of *Zhao* or *Belhumeur*. The Examiner apparently cites *Baudat* for the reference's alleged teaching of using GDA instead of LDA. (Office Action, p. 9:6.) *Baudat*, however, does not disclose or suggest performing both "LDA transforming the divided facial components into component descriptors of the facial components" and "GDA transforming the single vector into a single face descriptor." nor does the Examiner make such an assertion. (Office Action, p. 9:6-11.) Thus, *Zhao*, *Belhumeur* and *Baudat*, taken alone or in combination, cannot support a rejection of claim 1 under 35 U.S.C. § 103(a).

The applied references also cannot support a rejection of claims 2, 3, 5 and 8 at least due to these claims' dependence from claim 1.

Claim 19, although of different scope than claim 1, recites features similar to those recited in claim 1. Accordingly, *Zhao*, *Belhumeur* and *Baudat* also cannot support a rejection of claim 19 under 35 U.S.C. § 103(a), as well as claims 20, 23, 26 and 27, which depend from claim 19.

*Rejection of Claims 15, 16, 34 and 35 Under 35 U.S.C. § 103(a)*

Claims 15, 16, 34 and 35 depend from claims 10 and 29 and, therefore, include all the limitations recited in the claim from which they depend. The purported combination of *Zhao* and *Belhumeur* fails to teach "LDA transforming the divided facial components into component descriptors of the facial components" and "LDA transforming the single vector into a single face descriptor," as recited in claims 10 and 29. (*See supra.*) The Examiner relies on *Kouzani* for the reference's alleged disclosure of "dividing face components, in different features, which partially overlap each other." (Office Action, p. 10:15-16, *citing Kouzani*, Fig. 2.) *Kouzani* does not disclose or suggest the above-noted features of claim 10 and 29 missing from *Zhao* and *Belhumeur*; and the Examiner does not assert that *Kouzani* makes such a disclosure. Accordingly, *Zhao* and *Belhumeur* and *Kouzani*, taken alone or in any proper combination, do not support of a rejection of claims 15, 16, 34 and 35 under 35 U.S.C. § 103(a).

*Rejection of Claims 6, 7, 24 and 25 Under 35 U.S.C. § 103(a)*

*Zhao*, *Belhumeru*, *Baudat* and *Kouzani* fail to teach or suggest each and every feature recited in claims 1 and 19. (*See supra.*) Thus, these references also fail to teach or suggest the features recited in claims 6, 7, 24 and 25 which depend from claims 1 and 19. Accordingly, when taken alone or in any proper combination, *Zhao*, *Belhumeur*, *Baudat* and *Kouzani* fail to teach each and every feature recited in claims 6, 7, 24 and 25. Accordingly,

these references cannot support a rejection of claims 6, 7, 24 and 25 under 35 U.S.C. § 103(a).

Rejection of Claims 13 and 31 Under 35 U.S.C. § 103(a)

Claims 13 and 31 depend from claims 10 and 29 and, therefore, include all the limitations recited in the claim from which they depend. The purported combination of *Zhao* and *Belhumeur* fails to teach "LDA transforming the divided facial components into component descriptors of the facial components" and "LDA transforming the single vector into a single face descriptor," as recited in claims 10 and 29. (*See supra.*) The Examiner relies on *Erdogan* for its alleged disclosure of using a transformation matrix. (Office Action, p. 12:12-18.) However, *Erdogan* does not disclose, nor does the Examiner allege that *Erdogan* discloses, the above-noted features of claim 10 and 29 missing from *Zhao* and *Belhumeur*. Accordingly, when *Zhao*, *Belhumeur* and *Erdogan* are taken alone or in any proper combination, these references cannot support a rejection of claims 13 and 31 under 35 U.S.C. § 103(a).

Rejection of Claims 4 and 21 Under 35 U.S.C. § 103(a)

Claims 4 and 21 depend from claims 1 and 19, respectively, and therefore include all the limitations recited in the claim from which they depend. The purported combination of *Zhao*, *Belhumeur* and *Baudat* fails to teach each and every features in claims 1 and 19. (*See supra.*) In addition, as noted above with regard to claims 10 and 29, *Erdogan* does not cure the deficiencies of *Zhao*, *Belhumeur* or *Baudat*; nor is *Erdogan* relied on for such disclosure. Accordingly, when *Zhao*, *Belhumeur*, *Baudat* and *Erdogan* are taken alone or in any proper combination, these references fail to support a rejection of claims 4 and 21 under 35 U.S.C. § 103(a).

Rejection of Claims 22 and 32 Under 35 U.S.C. § 103(a)

Claims 22 and 32 depend from claims 19 and 29, respectively, and therefore include all the limitations recited in the claim from which they depend. As argued above with regard to claims 19 and 29, *Zhao*, *Belhumeur*, and *Baudat* fail to teach or suggest each and every feature in claims 19 and 29. *Bock* does not cure the deficiencies of *Zhao*, *Belhumeur*, and *Baudat*. *Bock* is apparently relied on by the Examiner for its alleged disclosure of "outputting face images of the identified face person." (Office Action, p. 14:6-7, citing *Bock*, p. 1, ¶ 5.) *Bock*, however, does not cure the aforementioned deficiencies of *Zhao*, *Belhumeur*, and *Baudat*, and the Examiner does not assert that *Bock* makes such a disclosure or suggestion. Accordingly, when *Zhao*, *Belhumeur*, *Baudat* and *Bock* are taken alone or in any proper combination, these references fail to support a rejection of claims 22 and 32 under 35 U.S.C. § 103(a).

**Conclusion**

In light of the foregoing, Applicant respectfully submits that claims 1-38 are in condition for allowance, and requests reconsideration and allowance of the above-captioned application. Should any residual issues exist, the Examiner is invited to contact the undersigned at the number listed below.

It is believed that the submission of this paper does not require additional fees.  
However, if additional fees are required for any reason, please charge Deposit Account No.  
02-4800 the necessary amount.

Respectfully submitted,

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